

Remarks

In view of the above amendments and the following remarks, reconsideration and further examination are requested.

The specification has been reviewed and revised to make an editorial revision thereto. No new matter has been added.

Claims 1, 2, 4-7, 10, 11 and 13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Huang (US 5,467,146) in view of Tomita (US 5,379,083).

Claims 3, 8, 9 and 12 have been indicated as containing allowable subject matter. The Applicants would like to thank the Examiner for this indication of allowable subject matter.

Claim 1 has been amended so as to further distinguish the present invention from the references relied upon in the rejection. Further, claim 2 has been amended so as to include some minor editorial revisions in light of the amendments to claim 1.

Claim 1 is patentable over the combination of Huang and Tomita, since claim 1 recites a projection display device having, in part, a shading means having an opening which is disposed at one of an incident side of a color selection means and an output side of the color selection means; and a spatial light modulator driving means for driving a spatial light modulator to display black during a period in which light which has passed through the opening has passed through two adjacent color filters and contains two colors. The combination of Huang and Tomita fails to disclose or suggest the shading means and the spatial light modulator driving means recited in claim 1.

Huang discloses an illumination control unit 17 for a light source 16. The illumination control unit 17 includes a first set of lenses 23, a color filter 24 that is rotatable by a motor 24a, a second set of lenses 25, an optical shutter 26, a prism 28, a projection lens 29 and a digital micro-mirror device (DMD) 15. In operation, a light beam from the light source 16 passes through the first set of lenses 23 and is focused on the color filter 24. The light beam then is further focused by the second set of lenses 25 to the optical shutter 26. If the optical shutter 26 is open, the light beam is allowed to pass. Otherwise, the light beam will continue no further in the illumination control unit 17. If the light beam passes through the optical shutter 26, it is then directed by the prism 28 to the DMD 15 and finally reflected to the projection lens 29 to be displayed on a screen. (See column 3, line 35 – column 4, line 24 and Figure 2).

In the rejection, it is indicated that the optical shutter 26 corresponds to the claimed shading means. However, the optical shutter 26 of Huang is a liquid crystal device having a liquid crystal layer sandwiched between glass supports. When a voltage is applied to the optical shutter 26, molecules in the liquid crystal layer align to allow the light beam to pass. Otherwise, the light beam will not be allowed to pass. (See column 3, lines 56-63). As admitted in the rejection, the optical shutter 26 does not have an opening as is recited with regard to the claimed shading means.

Further, the rejection indicates that the DMD 15 corresponds to the claimed spatial light modulator. However, Huang fails to disclose or suggest an element for driving the DMD 15 to display black during a period in which light which has passed through an opening in the optical shutter 26 has passed through two adjacent color filters of the color filter 24 and contains two colors. As a result, Huang also fails to disclose or suggest the claimed spatial light modulator driving means.

Since Huang fails to disclose or suggest the shading means and the spatial light modulator driving means as recited in claim 1, it is necessary for Tomita to disclose or suggest these features in order for the combination of Huang and Tomita to render claim 1 obvious.

Tomita discloses a projector 10 having a light source 11, a lens arrangement 13, an illumination aperture controller 16, a light valve 14 controlled by a controller 15, a projection aperture controller 19 and a lens arrangement 17. In operation, light from the light source 11 passes through the lens arrangement 13 and the illumination aperture controller 16. The illumination aperture controller 16 is adjustable to provide a variable illumination aperture to thereby control a degree of collimation of the light reaching the light valve 14. The illumination aperture controller 16 is adjusted so that the projector 10 will have the maximum real contrast and best image quality of an image projected by the light. (See column 2, line 43 – column 3, line 22 and Figure 1a).

The illumination aperture controller 16 of Tomita is indicated as corresponding to the claimed shading means. In this regard, the illumination aperture controller 16 does have an adjustable opening therein. (See Figure 1a). However, it is apparent that the illumination aperture controller 16 is not disposed at one of an incident side of a color selection means and an output side of the color selection means, since Tomita fails to disclose or suggest an element corresponding to the color selection means of claim 1. Further, it is apparent that it would not

have been obvious to replace the optical shutter 26 of Huang with the illumination aperture controller 16 of Tomita, since the illumination aperture controller 16 is operable to adjust the illumination aperture of the light to have the maximum real contrast and best image quality of an image projected by the light, while the optical shutter 26 is operable to either prevent or allow the passage of the light beam. Therefore, the illumination aperture controller 16 of Tomita cannot be combined with the illumination control unit 17 of Huang in a manner to disclose or suggest the claimed shading means.

The rejection also indicates that the light valve 14 of Tomita corresponds to the claimed spatial light modulator driving means. Regarding this, it is noted that the controller 15 controls which elements of the light valve 14 are transmissive or scattering. (See column 2, lines 55-58). However, Tomita fails to disclose or suggest that the controller 15 drives the light valve 14 to display black during a period in which light which has passed through the opening of the illumination aperture controller 16 has passed through two adjacent color filters and contains two colors. There is no discussion in Tomita of how the controller 15 controls the light valve 14.

Since neither Huang, nor Tomita, discloses or suggests the shading means or the spatial light modulator driving means as recited in claim 1, it is apparent that the combination of Huang and Tomita fails to render the present invention as recited in claim 1 obvious.

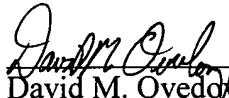
Because of the above-mentioned distinctions, it is believed clear that claims 1-13 are allowable over the references relied upon in the rejection. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 1-13. Therefore, it is submitted that claims 1-13 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

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July 5, 2005